

REQUEST FOR PROPOSAL (RFP) #10-1

TRANSPORTATION CONFORMITY PARTICULATE MATTER HOT-SPOT AIR QUALITY MODELING

POSTED DATE: 6/30/10; CLOSING DATE: 8/16/10

PROJECT DATA

Funds: \$85,000 total, including a required 25% (\$21,250) cost share from

proposing agency

Contract Term: 12 months

Projected Start Date: December 1, 2010

Deadline for Submitting Proposals: August 16, 2010 **Submit Proposals via Email to:** DaveKing@illinois.edu

BACKGROUND

Project level particulate matter (PM) hot-spot regulations require projects in non-attainment and maintenance areas that are "projects of air quality concern" to model and analyze for PM and report the results in Illinois Department of Transportation (IDOT) National Environmental Policy Act (NEPA) documents prepared for IDOT projects. The USEPA PM_{2.5} and PM₁₀ Hot-Spot regulations (40 CFR Part 93, FR March 10, 2006) did not identify a threshold (Average Daily Traffic [ADT] count and percent diesel trucks) to determine what a project of air quality concern is.

Currently, the Federal Highway Administration (FHWA) and the IDOT, Bureau of Design and Environment (BDE), require project ADT (existing and proposed) and the percent diesel trucks be provided to determine if a project is of air quality concern. IDOT districts are required to provide and present this information, usually at a District Coordination Meeting. Based on the traffic volumes and percent diesel trucks, FHWA/BDE determines if a project is of air quality concern. New and approved "Illinois" specific ADT and percent diesel truck thresholds would provide IDOT with specific level(s) that could be defended, if challenged, and would reduce the work required by district staff to obtain and present project specific traffic data. Projects that exceed the

approved thresholds (projects of air quality concern) would require additional PM modeling be undertaken.

OBJECTIVE

The purpose of this research project is to quantitatively model motor vehicle-generated PM in Illinois' $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance areas (located in IDOT Districts 1, 3 and 8), develop "Illinois" specific thresholds for these areas, and secure USDOT and USEPA approval for IDOT to use these thresholds to determine if a project is a project of air quality concern. This information will be documented in IDOT NEPA documents or Project Reports.

RESEARCH TASKS AND REQUIRED DELIVERABLES

IDOT is seeking a researcher to:

- Generate "Illinois specific" PM_{2.5} and PM₁₀ emission factors (both Annual and 24-hour) for Illinois' PM_{2.5} and PM₁₀ Nonattainment and Maintenance areas, using USEPA's Motor Vehicle Emission Simulator (MOVES2010) emission factor model. Model various roadway types, speeds, and months of the year;
- Using USEPA's CAL3QCHR or AERMOD models (see Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas-Public Draft, EPA-420-P-10-001, May 2010), model various vehicle traffic volumes and percent diesel trucks using the appropriate emission factors, receptors locations, and adding the background PM concentrations, to predict the PM_{2.5} and PM₁₀ pollutant concentrations;
- Compare these concentrations to the Annual and 24-hour PM_{2.5} and PM₁₀ National Ambient Air Quality Standards (NAAQS);
- Assist in developing, defending and securing approval of Illinois-specific thresholds for IDOT's use in NEPA documents/Project Reports;
- Once thresholds are developed and approved, develop a graphical user interface program (similar to IDOT's COSIM Model), which will allow IDOT staff to input simple parameters such as ADT, percent diesel trucks, county, year, etc. The output will indicate to the user if the proposed project is a project of air quality concern; and
- Produce a Final Report following ICT report formats that documents the project results, including all inputs used in the MOVES2010 emissions model and the CAL3QHCR and AERMOD models, the background concentrations used, all modeling runs, meeting discussions, thresholds recommended, and final approval acquired by USDOT and USEPA.

IDOT will form a Technical Review Panel (TRP) to help lead and steer the research project. At a minimum, the TRP will consist of staff members from IDOT, the Illinois Environmental Protection Agency (Illinois EPA), and FHWA. The researcher will work closely, meet with, and/or have conference calls with the TRP throughout the project. The TRP will recommend the appropriate PM_{2.5} and PM₁₀ background concentrations and the proper MOVES2010 emission factor inputs to use within Illinois' Nonattainment

and Maintenance Areas. Prior to commencement of modeling, the researcher will participate in Inter Agency Consultation meetings at the offices of the Chicago Metropolitan Agency for Planning (CMAP) and the East-West Gateway Council of Governments (EWGCOG) to brief committee members and agency staff on the purpose of the project, modeling protocols to be used, and outcomes of the proposed research. Recommendations of these committees will be incorporated into the research, upon approval of the TRP. Once the background information and MOVES2010 emission factor inputs are agreed upon by IDOT and Illinois EPA staff, and CMAP and EWGCOG committees briefed, the researcher will model highway projects to identify "Projects of Air Quality Concern".

The researcher will be required to model various traffic volumes and diesel truck percentages, different roadway classifications (e.g. urban and rural), and model different months and speeds on the different roadway facility types, as outlined in the MOVES2010 emissions model. Modeling will be needed for the Illinois' PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas, using the specific PM background data and associated emission factors for the area, to predict the total traffic volumes and the percent diesel truck (threshold(s)) that would exceed the Annual and Daily PM_{2.5} and PM₁₀ NAAQS. These threshold(s), developed as a result of the modeling, will help IDOT determine when a quantitative PM Hot-Spot analysis would be required to be performed for their proposed highway projects in Illinois' PM _{2.5} and PM₁₀ Nonattainment and Maintenance Areas.

Once the air quality modeling is complete, the researcher will present his/her modeling results and the proposed threshold(s) to the TRP for review. After TRP review and approval, the modeling results and proposed threshold results will be presented at Inter Agency Consultation meetings at CMAP and EWGCOG for approval by both USDOT and USEPA as outlined in 40 CFR 93.123(b)(3).

The researcher will be required to develop a graphical user interface computer program (similar to IDOT's COSIM pre-screen carbon monoxide model), which will have the appropriate approved modeling data tables incorporated. It is anticipated that the following minimum inputs will be required for this program: County, ADT, percent diesel trucks, and year of evaluation. Based on the data inputs, the program will then generate a short report outlining if the project is a project of air quality concern.

Once approved by USDOT and USEPA, IDOT will implement the thresholds in their proposed highway projects in Illinois' PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas.